

REMARKS

The present Amendment amends claims 1-8 and adds new claims 9-16. Therefore, the present application has pending claims 1-16.

In the Office Action the Examiner objected to Information Disclosure Statement (IDS) filed March 11, 2005 as not providing an English language translation or discussion of the relevance of Japanese Patent application 03-127157. Attached is a Form PTO-1449 with a copy of the English language abstract of Japanese Patent application 03-127157. Therefore, this objection is overcome and should be withdrawn.

The drawings stand objected to due to informalities indicated by the Examiner, particularly with respect to Fig. 6. Filed on even date are proposed Drawing Corrections to correct the informalities indicated by the Examiner. Therefore, this objection is overcome and should be withdrawn.

The specification stands objected to as allegedly not being check to the extent necessary to determine the presence of all possible minor errors.

Applicants have reviewed the specification to the extent necessary to uncover any minor errors grammatical and editorial in nature that required correction.

No such errors were uncovered. Thus, the Examiner is respectfully requested to identify any errors the Examiner may be aware of so that such errors can be immediately corrected to expedite prosecution of the present application.

Therefore, reconsideration and withdrawal of this objection is respectfully requested.

Claims 1, 2, 6 and 8 stand rejected under 35 USC §102(e) as being anticipated by Terrell (U.S. Patent Application Publication No. 2005/0232285) and (U.S. Patent Application Publication No. 2003/0210686); and claims 3

and 5 stand rejected under 35 USC §103(a) as being unpatentable over Terrell '285 and further in view of Horn (U.S. Patent Application Publication No. 2004/0034751). These rejections are traversed for the following reasons. Applicants submit that the features of the present invention as now more clearly recited in claims 1-3, 5, 6 and 8 are not taught or suggested by Terrell '285, Terrell '686 or Horn whether taken individually or in combination with each other as suggested by the Examiner. Therefore, Applicants respectfully request the Examiner to reconsider and withdraw these rejections.

Amendments were made to claims 1-3, 5, 6 and 8 to more clearly describe features of the present invention. Particularly amendments were made to the claims to more clearly recite features of the present invention not taught or suggested by Terrell '285, Terrell '686 or Horn whether taken individually or in combination with each other as suggested by the Examiner.

The present invention as now recited in the claims is directed to a virtualization controller which is connected to one or a plurality of storages and one or a plurality of host computers. The virtualization controller includes a plurality of ports connected to one or both of the host computer and the storage and one or a plurality of storage controllers.

According to the present invention each of the ports and the storage controllers includes a virtualization processor which holds corresponding information between first identification information and second identification information, the first identification information being used for the host computer to access a storage area held by the storage, and the second identification information being used for the virtualization controller to identify the storage area, converts based on the corresponding information data

having the first identification information received from the host computer into data having the second identification information, transfers the data thus converted to a storage having the storage area, converts data having the second identification information received from the storage into data having the first identification information, and transfers the data thus converted to the host computer. The virtualization processor includes access path management information which registers a first port controlled by the host computer, a second port connected to the storage, and the virtualization processor, as an access path for each storage area of the storage.

Further, according to the present invention when a request for changing the access path is received, the access path management information is updated, and data send/receive control is carried out between the host computer and the storage area of the storage by use of a new access path. In addition according to the present invention when the virtualization processor determines a type of access to a storage area being requested by an access request, manages information of the type of access being requested as access history management information and changes an access path based on the access history management information.

The above described features of the present invention now more clearly recited in the claims are not taught or suggested by any of the references of record whether taken individually or in combination with each other. Particularly, the above described features of the present invention as now more clearly recited in the claims are not taught or suggested by Terrell '285, Terrell '686 or Horn whether taken individually or in combination with each other as suggested by the Examiner in the Office Action.

Terrell '285 teaches A network node for processing messages transmitted via a network, the node including: a first circuit providing a processor-based node path; a second circuit, coupled to the first circuit, providing a switch-based node path; and a memory storing mapping information accessible by the first and second circuits, wherein the processing of messages received by the network node is allocated between the first and second circuit based on the mapping information.

Terrell '686 teaches a router for use in a network, including a scalable architecture, that performs methods for implementing quality of service on a logical unit behind a network port; and for implementing storage virtualization. The architecture includes a managing processor, a supervising processor; and a plurality of routing processors coupled to a fabric. The managing processor has an in-band link to a routing processor. A routing processor receives a frame from the network, determines by parsing the frame, the protocol and logical unit number, and routes the frame to a queue according to a traffic class associated with the logical unit number in routing information prepared for the processors. An arbitration scheme empties the queue in accordance with a deficit round robin technique. If a routing processor detects the frame's destination is a virtual entity, and so is part of a virtual transaction, the router conducts a nonvirtual transaction in concert with the virtual transaction. The nonvirtual transaction accomplishes the intent of the virtual transaction but operates on an actual network port, for example, a storage device.

However, at no point is there any teaching or suggestion in Terrell '285 or Terrell '686 of the above described features of the present invention of a

virtualization controller, an access path control method of the virtualization controller, and a computer system, wherein the virtualization controller carries out an access path switching process based on the types of accesses being requested by access requests, information regarding the history of the types of access requests, and usage status of various resources constituting the virtualization controller, allowing a distribution control of processing load within the virtualization controller, and consequently, achieving an enhancement of the access performance to the storage system.

Thus, both Terrell '285 or Terrell '686 fail to teach or suggest that the virtualization processor provided in each of the ports and the storage controllers determines a type of access to a storage area being requested by an access request, manages information of the type of access being requested as access history management information and changes an access path based on said access history management information as recited in the claims.

Therefore, as is quite clear from the above, the features of the present invention as now more clearly recited in each of the claims are not taught or suggested by Terrell '285 or Terrell '686 whether taken individually or in combination with each other or any of the other references of record. Accordingly, reconsideration and withdrawal of the 35 USC §102(e) rejection of claims 1, 2, 6 and 8 as being anticipated by Terrell '285 or Terrell '686 is respectfully requested.

The above described deficiencies of Terrell '285 are also evident in Horn. Therefore, combining the teachings of Terrell '285 and Horn in the manner suggested by the Examiner in the Office Action would still fail to teach

or suggest the features of the present invention as now more clearly recited in the claims.

Horn teaches an apparatus and method for per-command, asymmetrical load balancing in a networked storage system that includes several storage volumes and a networked storage system controller/virtualizer. As per Horn the networked storage system controller/virtualizer includes a first transaction processor and, optionally, a second transaction processor and that in one networked storage system controller/virtualizer implementation, the transaction processors may use one of a plurality of available paths to communicate to a number of storage volumes in the storage system. The networked storage system controller/virtualizer acquires real-time knowledge of the path and storage volume workload. The hardware-accelerated transaction processor performs a cost function calculation in real-time on a per-command basis in order to continually determine the optimal storage volume to access and optimum path routing. The cost function is calculated considering the number of outstanding commands, the number of pending commands, and the size of commands, in order to continually balance the load of command traffic across the storage system.

The above described teachings of Horn do not anticipate or render obvious the features of the present invention as now recited in the claims.

Thus, Horn fails to teach or suggest that the virtualization processor provided in each of the ports and the storage controllers determines a type of access to a storage area being requested by an access request, manages information of the type of access being requested as access history

management information and changes an access path based on said access history management information as recited in the claims.

Therefore, since each of Terrell '285 and Horn are deficient of the same features relative to the present invention as recited in the claims, the combination of Terrell '285 and Horn fails to teach or suggest the features of the present invention as now more clearly recited in the claims. Accordingly, reconsideration and withdrawal of the rejection of claims 3 and 5 under 35 USC §103(a) as being unpatentable over Terrell '285 and Horn is respectfully requested.

Applicants acknowledge the Examiner's indication in paragraph 10 of the Office Action that claim 7 is allowed.

Applicants also acknowledge the Examiner's indication in paragraph 4 of the Office Action that claim 4 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Amendments were made to claim 4 to place it in independent form including all the limitations of the base claim and any intervening claims. Therefore, claim 4 is allowable as indicated by the Examiner.

The remaining references of record have been studied. Applicants submit that they do not supply any of the deficiencies noted above with respect to the references utilized in the rejection of claims 1-3, 5, 6 and 8.

As indicated above the present Amendment adds new claims 9-16 which variously depend from claims 1, 4, 7 and 8. Since new claims 9-16 which variously depend from claims 1, 4, 7 and 8 the same arguments presented above with respect to claims 1, 4, 7 and 8 apply as well to claims 9-

16. Therefore new claims 9-16 are allowable for the same reasons as those set forth above with respect to claims 1, 4, 7 and 8.

In view of the foregoing amendments and remarks, applicants submit that claims 1-8 are in condition for allowance. Accordingly, early allowance of claims 1-8 is respectfully requested.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (566.43395X00).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



Carl I. Brundidge
Registration No. 29,621

CIB/jdc
(703) 684-1120